Mark Scheme (Results)

Summer 2018

Pearson Edexcel International GCSE
In Mathematics A (4MA0) Paper 2FR

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- **Types of mark**
    - M marks: method marks
    - A marks: accuracy marks
    - B marks: unconditional accuracy marks (independent of M marks)
- **Abbreviations**
    - cao – correct answer only
    - ft – follow through
    - isw – ignore subsequent working
    - SC - special case
    - oe – or equivalent (and appropriate)
    - dep – dependent
    - indep – independent
    - eeoo – each error or omission

- **No working**
  If no working is shown then correct answers normally score full marks
  If no working is shown then incorrect (even though nearly correct) answers score no marks.
- **With working**
  If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
  If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks.
  Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.
  If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
  If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.
  If there is no answer on the answer line then check the working for an obvious answer.
- **Ignoring subsequent work**
  It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.
  It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.
  Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.
- **Parts of questions**
  Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

International GCSE Maths

Apart from questions 17a(ii), 21 and 24 (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an incorrect method, should be taken to imply a correct method.

Question		Working	Answer	Mark	Notes
1	(a)		176	1	B1
	(b)(i)		Arrow pointing to 2.28	1	B1
	(ii)		0.08	1	B1oe, e.g. $\frac{2}{25}$
	(c)		0.0011, 0.063, 0.07, 0.6, 0.77	1	B1
	(d)	$(12.9+13.7)\div 2$ or $12.9+(13.7-12.9)\div 2$	13.3	2	M1 any complete method to find halfway value A1
					Total 6 marks
2	(a)(i)		millilitres	1	B1 Condone incorrect spelling if meaning clear. Allow ml or cm^3
	(ii)		centimetres	1	B1 Condone incorrect spelling if meaning clear. Allow cm.
	(b)		4300	1	B1
					Total 3 marks

Question		Working	Answer	Mark	Notes
3	(i)		tangent	1	B1 Condone incorrect spelling if meaning clear.
	(ii)		radius	1	B1 Condone incorrect spelling if meaning clear.
	(iii)		chord	1	B1 Condone incorrect spelling if meaning clear.
					Total 3 marks
4	(a)		6079	1	B1
	(b)		400	1	B1 Hundred(s), 4 hundred(s), 100
	(c)		72.2	1	B1
	(d)	18, 36, 54, 72, 90, 108, 126, 144, 162, 180, …	e.g. 18, 36	1	B1 Any two multiples of 18
	(e)		70	1	B1
	(f)		$25+3\times(7-2)=40$	1	B1 Correct brackets
	(g)		8607	1	B1
					Total 7 marks
5	(a)		3, 7, 5, 3, 2	2	B2 For all correct frequencies B1 for 3 or 4 correct frequencies or at least 3 correct tallies
	(b)		1	1	B1ft From table
	(c)		$\frac{3}{20}$	1	B1ft From table oe
					Total 4 marks

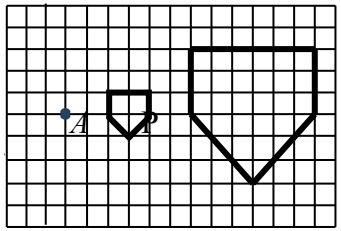
Question	Working	Answer	Mark	Notes
6 (a)		Kazan	1	B1 Accept −12
(b)		15	1	B1 Accept −15
(c)		11	1	B1
				Total 3 marks
7	$40-19.50\left(=20.5(0)\right)$ or $40-8.56\left(=31.44\right)$	6	4	M1 Correct method to find money left after taking away cost of rake or change
	$40-19.50-8.56\left(=11.94\right)$			M1 Correct method to find money left after taking away cost of rake & change
	"11.94"÷1.99			M1 A fully correct method to find number of packets of seed
				A1
				Total 4 marks
8 (i)		B	1	B1 Accept $\frac{3}{12}$ oe
(ii)		E	1	B1 Accept $\frac{9}{12}$ oe
(iii)		F	1	B1 Accept 1
(iv)		A	1	B1 Accept 0
				Total 4 marks

Question		Working	Answer	Mark	Notes	
9	(a)		16 45	1	B1	
	(b)		130	1	B1	
	(c)		8 19 pm	1	B1	Accept 20 19
						Total 3 marks
10	(a)	$\frac{360}{240}(=1.5)$ oe or $\frac{38}{240}$	57	2	M1	For a correct method to find angle for 1 throw or fraction of full circle
					A1	
	(b)	$\frac{250}{100}\times 360$ oe or $60\times 2.5+80\times 2.5+250+70\times 2.5+50\times 2.5$ $(=150+200+250+175+125)$	900	2	M1	For a correct method to find number of spins
					A1	
						Total 4 marks
11	(a)		$3t$	1	B1	
	(b)		$15pq$	1	B1	
	(c)		$4y - 20$	1	B1	
	(d)	$8x = 5\times 9.2$ or $8x = 46$ or $\frac{x}{5}=\frac{9.2}{8}$	5.75	2	M1	Clearing fraction or dividing by 8
					A1	oe 46/8 etc
						Total 5 marks

Question	Working	Answer	Mark	Notes
12 (a)	$0.5\times(22+25)\times12$ oe	282	2	M1 Correctly substituting values into formula for area of trapezium A1
				Total 2 marks
13 (a)		10	1	B1
(b)	7 ÷ 0.5 or 7 km in 0.5 hours oe	14	2	M1 A1
(c)		"Horizontal" line from (2 10, 16) to (2 50,16) "Diagonal" line from (2 50, 16) to (3 50, 0)	2	M1 For correct horizontal line or diagonal line with negative gradient to (3 50, 0) A1 Fully correct graph
				Total 5 marks
14	$360\div1.25(=288)$ **or** $425\times0.72(=306)$	18	3	M1
	$360\div1.25(=288)$ **and** $425\times0.72(=306)$			M1 A1 cao
				Total 3 marks

Question	Working	Answer	Mark	Notes	
15	$39\ 000 \div 3 (= 13\ 000)$ oe	9	5	M1 $\frac{1}{3} \times 39\ 000$ oe	M2 for $\frac{2}{3} \times 39\ 000$
	$39\ 000 - '13\ 000' (= 26\ 000)$ oe			M1	
	$0.55 \times 5\ 300 (= 2915)$ oe			M1 A correct method to find 55% of 5 300	
	"26 000" ÷ "2915" $(= 8.919...)$			M1 A correct method to find the number of weeks	
				A1	
					Total 5 marks
16		2 , 20, 29	3	M2 for 3 number selected with at least two of the properties: mean = 17, median = 20, range = 27 else M1 with one of these properties	
				A1 in any order	
Alternative					
16	17 × 3 (= 51)	2 , 20, 29	3	M1 method to find sum of 3 numbers	
	17 × 3 – 20 (=31)			M1 method to find sum of smallest and largest numbers	
				A1 in any order	
Alternative					
16	x, 20, z or x, y, z and $y = 20$	2 , 20, 29	3	M1 use of different letters with 20 shown as the middle value	
	$x + z = 31$ or $\frac{x + 20 + z}{3} = 17$ oe or $z - x = 27$ or $x - z = 27$			M1 an equation for the sum or for the difference of the two unknown numbers	
				A1 in any order	
					Total 3 marks

Question	Working	Answer	Mark	Notes
17 (a)(i)		67	1	B1
(ii)		reason	1	B1 dep on B1or a fully correct method shown in (i) e.g. alternate angles are equal or other fully correct method
(b)	e.g. 180 – (67 + 60) or 120 – 67 or (180 – 67) – (180 – 120) or 113 – 60 or 180 – 67 = 60 + y or 113 = 60 + y or 120 – y = 67	53	2	M1 Correct calculation for y or correct equation in y, or $BFC = 60°$ and $BCF = 67°$ or $ABF = 60°$ and $BCF = 67°$ or $ABF = 60°$ and $ABC = 113°$ A1
				Total 4 marks
18	(0 × 2) + 1 × 7 + 2 × 3 + 3 × 4 + 4 × 3 + 5 × 1 (0 +) 7 + 6 + 12 + 12 + 5	42	2	M1 For at least 4 correct products seen with the intention to add. A1 SC B1 for 2.1
				Total 2 marks
19	$\frac{6}{100}$ × 8.50 or 0.06 × 8.50 or 0.51 or 51p 8.50 + "0.51"	9.01	3	M1 M1 dep (M2 for 1.06 × 8.50 oe) A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
20 (a)		A correct enlargement in the correct position	2	M1 Enlargment of given shape by SF 3 anywhere on grid or completely correct enlargement by SF 2 A1 Fully correct
(b)		Rotation (Centre) (0,0) 90° clockwise oe	3	B1 B1 *O* or origin B1 −90°, 270° If more than one transformation mentioned then no marks
				Total 5 marks
21	e.g. $7x = 4x - 13.5$ or $7x - 4x = -13.5$ or $7x + 13.5 = 4x$ or $4y - 7y = 54$	$x = -4.5$ $y = -18$	3	M1 For correctly eliminating y or x
	e.g. $y = 4 \times$ "-4.5" or $4x =$ "-18" or $7 \times$ "-4.5" $- y = -13.5$			M1 dep on first M1 For method to find second variable A1 dep on first M1 for both answers
				Total 3 marks

Question	Working	Answer	Mark	Notes
22	$\cos A = \frac{43}{70}$ (=0.6142) or $\sin B = \frac{43}{70}$ (=0.6142)	142	4	M1 $\cos B = \frac{55.23...}{70}$, $\sin A = \frac{55.23...}{70}$
	$A = \cos^{-1}\left(\frac{43}{70}\right)$ or $B = \sin^{-1}\left(\frac{43}{70}\right)$			M1 $A = \sin^{-1}(0.7890...)$ $B = \cos^{-1}(0.7890...)$
	A = 52.1° or B = 37.9°			A1 52° - 52.1° or 37.9° - 38° **SC B1** If M0 M0 A0 award B1 for 52.1° or 37.9° not identified as A or as B
				B1 ft for an angle identified as A or B Correct bearing (142 – 142.1)
				Total 4 marks
23 (a)		m^{11}	1	B1
(b)		$27a^6b^{12}$	2	B2 fully correct B1 for 2 of the three terms correct in a product.
(c)	$4g - 8h + 10g - 15h$	$14g - 23h$	2	M1 Expanding brackets with 3 of 4 terms correct.
				A1 Fully correct
(d)	$y^2 - 7y + 5y - 35$	$y^2 - 2y - 35$	2	M1 Any 3 terms correct or 4 correct terms ignoring signs or $y^2 - 2y$ +/–... or ...–$2y$ –35
				A1
				Total 7 marks

Question	Working	Answer	Mark	Notes
24	eg 280 = 2 × 140 = 2 × 2 × 70 (= 2 × 2 × 2 × 35 = 2 × 2 × 2 × 5 × 7) eg 280 = 10 × 28 = 2 × 5 × 28 (= 2 × 5 × 2 × 14 = 2 × 5 × 2 × 2 × 7)	2 × 2 × 2 × 5 × 7	3	M1 for at least 2 correct steps in repeated factorisation (may be seen in a tree diagram)
	2, 2, 2, 5, 7			A1dep For all correct factors, may include 1 A1dep Must see correct method Accept $2^3 \times 5 \times 7$
				Total 3 marks
25 (a)		$-3 \leqslant x < 4$	2	B2 B1 for one end of inequality correct ie $-3 \leqslant x$ or $x < 4$ or $-3 < x \leqslant 4$
(b)	$-5-3 \leqslant 2p < 13-3$ or $-5-3 \leqslant 2p$ **and** $2p < 13-3$ or $-\frac{5}{2} \leqslant \frac{2p+3}{2} < \frac{13}{2}$ or $-\frac{5}{2} \leqslant \frac{2p+3}{2}$ **and** $\frac{2p+3}{2} < \frac{13}{2}$	$-4 \leqslant p < 5$	3	M2 Correctly subtracting 3 from each part of the inequality or dividing each term by 2 or (p =) -4 **and** (p =) 5 M1 for one end correct e.g. $2p \geqslant -5-3$ or $\frac{2p+3}{2} < \frac{13}{2}$ or (p =) -4 **or** (p =) 5
				A1 accept $p \geq -4$ and $p < 5$
				Total 5 marks